California Regional Water Quality Control Board
North Coast Region

Monitoring and Reporting Program No. R1-2006-0039

For

THE PACIFIC LUMBER COMPANY,
SCOTIA PACIFIC COMPANY LLC,
AND SALMON CREEK CORPORATION

P.O. Box 37
Scotia, CA 95565

ELK RIVER
Humboldt County

This Monitoring and Reporting Program (MRP) is issued pursuant to 13267(b) and is associated with the Elk River watershed-wide Waste Discharge Requirements (hereinafter referred to as "watershed-wide WDRs") Order Number R1-2006-0039. The reasons for needing this information, for requiring the named Dischargers above to provide this information, and the evidence supporting requiring this information can be found in the watershed-wide WDRs, the related findings adopted with the watershed-wide WDRs in Resolution No. R1-2006-0038, and the technical documents.

Under the authority of the California Water Code section 13267(b), the Discharger named above is required to comply with the following:

A. Water Quality Trend Monitoring

1. Objectives

   Evaluate if the provisions of the watershed-wide WDRs, in combination with the other sediment control measures applied in the watershed, result in a consistent trajectory toward conditions supportive of beneficial uses of water and toward reducing the currently elevated frequency and magnitude of flooding.

2. Monitoring Plan Components

   a) Parameters to be measured

   - Stage (m or feet)
   - Velocity (m/sec or ft/sec)
   - Streamflow (m^3/sec or ft^3/sec)
   - Turbidity (NTU)
   - Suspended sediment concentration (mg/L)
   - Conductivity (µ-mhos)

   b) Locations

   Measurement of all parameters shall continue to be measured at existing monitoring locations maintained by the Discharger, as demonstrated in Attachment 1. Conductivity shall be measured at locations where the existing equipment has a conductivity meter.

c) Method of measurement

The Discharger has established existing and accepted methods of measurement already implemented at the monitoring locations and shall provide the Executive Officer with the most updated procedures in the form of a Quality Assurance Project Plan (QAPP) and associated Standard Operating Procedures (SOPs) for their measurement at these existing stations and conduct measurements accordingly.

d) Sampling Frequency

Turbidity and stage will be measured simultaneously, at 10 -minute increments. Streamflow shall be measured at an interval to ensure that a wide range of all flows is measured and incorporated into the stage-streamflow relationships at the monitoring locations. Equipment maintenance shall occur weekly.

e) Data analysis methods and performance standards

Standard analysis methods will be used to evaluate all data collected under the requirements of this MRP with respect to the stated objectives. More specifically, descriptive statistics will be used to describe the behavior of each stated parameter according to hydrologic year. Informational items related to streamflow, turbidity, and suspended sediment concentration shall be developed by the Discharger according to hydrologic year, including rating curves for stage-streamflow, field turbidity-lab turbidity, streamflow-turbidity, and turbidity-suspended sediment relationships. The Discharger shall utilize these relationships to develop "finalized data" which represent, stage, lab turbidity, and streamflow.

f) Reporting

i) At a minimum, all raw data shall be submitted electronically on the 10th of each month for the previous calendar month monitoring period.

ii) Electronic and hardcopy reports shall be submitted annually by August 1 and shall contain all raw and processed data from the previous May 1 – May 1 monitoring period. Electronic reports shall include, at a minimum, a description of each monitoring site and equipment used in the collection of data, <u>all</u> raw and processed data in tabular form, graphics and supporting data representing the relationships used in any data transformation, and complete disclosure of all possible sources of error, as well as an activity log of monitoring activities at each site and observations made by field staff. The Discharger may choose to submit, in addition, an analysis of the data and discussion of findings, as well as recommendations for improvements or changes to the monitoring and reporting requirements.

iii) The Discharger shall provide both draft hardcopy and electronic report formats to the Executive Officer for review by June 15 of each calendar year. Upon receipt, the Executive Officer shall have 30 days to review and comment. The Discharger shall make the responsive revisions, if necessary, and resubmit within 14 days of receipt of the Executive Officer's comments for the Executive Officer's approval. If however, the Executive Officer does not provide comments within 30 days upon receipt, then the submitted report formats shall be considered accepted.

g) Program Documentation, Quality Assurance and Quality Control

The Discharger has already developed and implemented SOPs and QAPPs that contain applicable methods, quality assurance and quality control measures for activities specified under this portion of the MRP. The existing QAPPs and SOPs shall be revised appropriately to meet the specification of this MRP and to meet the guidelines available from the US Environmental Protection Agency (EPA). Collectively, the SOPs and QAPP documents shall provide detailed information regarding all aspects of this monitoring plan, including: parameters to be measured, sampling locations, methods of measurement, sampling frequencies, data analysis methods, and reporting. Monitoring shall be conducted according to SOPs and QAPP specifications.

h) Time schedule for implementation

i) The Discharger shall provide the SOPs and QAPP to the Executive Officer for review by July 1, 2006. Upon receipt, the Executive Officer shall have 30 days to review and comment and the Discharger shall make the responsive revisions, if necessary, and resubmit within 14 days of the Executive Officer's comments for the Executive Officer's approval. If however, the Executive Officer does not provide comments within 30 days upon receipt, then the submitted SOPs and QAPP shall be considered accepted and the Discharger shall implement the accepted SOPs and QAPP.

3. Timing and Duration of Monitoring Plan

Sampling for stage, streamflow, turbidity, suspended sediment concentration, and conductivity under this portion of the monitoring agreement shall begin no later than September 15, 2006 according to the accepted SOPs and QAPP and shall continue until the objectives are achieved.

B. Nuisance Flooding Monitoring

1. Objectives

Evaluate the effectiveness of the watershed-wide WDRs provisions at increasing the recurrence interval associated with nuisance flood stage.

2. Monitoring Plan Components

a) Parameters

- Stage – Streamflow relationships
- Recurrence Interval of nuisance flooding

b) Locations

- North Fork Elk River Concrete Bridge
- An appropriate Lower South Fork Elk River location
- Mainstem Elk River at the historic USGS Gage Site

For safety reasons, the Discharger may select to develop reliable relationships between the streamflow at the nuisance locations and other nearby locations.

c) Method of measurement

- The Discharger shall submit and implement appropriate SOPs documenting standard methods for measurement of area weighted velocity measurements and cross-sectional area, and recurrence interval calculation consistent with Section A.2.g.
- Existing staff plates shall be improved and new staff plates installed as necessary and appropriate.
- The stage-streamflow relationship shall be established based upon streamflow measurements and stage observations.
- The nuisance flood stages shall be determined based on topographic surveys at locations where flooding is a nuisance to the community and linkage to stage at the streamflow measurement locations.
- The recurrence interval of nuisance flooding over the roadways shall be based upon the stage-streamflow relationships, the applicable streamflow records, and an appropriate frequency analysis such as the partial duration series.

d) Frequency

The stage-streamflow relationships shall be maintained throughout the winter period and measurements shall be conducted over the range of observed flows.

e) Data analysis methods and performance standards

- The stage-streamflow relationship shall be established based upon discharge measurements and stage observations.
- The nuisance flood stages shall be determined based on topographic surveys at locations where flooding is a nuisance to the community and linkage to stage at the streamflow measurement locations.
- The recurrence interval of nuisance flooding over the roadways shall be based upon the stage-streamflow relationships, the applicable streamflow records, and an appropriate frequency analysis such as the partial duration series.

f) Reporting

The Discharger shall provide electronic reports to the Executive Officer by November 15, January 15, March 15, and June 15, containing at a minimum:

- The individual velocity and area measurements in uniformly formatted Excel spreadsheets with all field notes
- The most current stage-discharge relationships and the supporting measured data.

g) Program Documentation, Quality Assurance and Quality Control

i) The Discharger shall provide the SOPs and QAPP to the Executive Officer for review by July 1, 2006. Upon receipt, the Executive Officer shall have 30 days to review and comment and the Discharger shall make the responsive revisions, if necessary, and resubmit within 14 days of the Executive Officer's comments for the Executive Officer's approval. If however, the Executive Officer does not provide comments within 30 days upon receipt, then the submitted QAPP shall be considered accepted and the Discharger shall implement the accepted QAPP.

ii) Monitoring under this portion of this MRP shall begin September 15, 2006 according to the accepted SOPs and QAPP.

3. Timing and Duration of Monitoring Plan

Monitoring and reporting for stage, streamflow, and recurrence interval associated with nuisance flood stage under this portion of the MRP shall begin no later than September 15, 2006 according to the accepted SOPs and QAPP, and shall be in effect throughout the life of the watershed-wide WDRs permit.

C. Channel Storage Trend Monitoring

1. Objectives

- Identify any changes in storage of sediment in the depositional areas of Elk River.
- Identify the hydraulic flow regime, and if and where there are hydraulic controls contributing to the flow regime.

2. Monitoring Plan Components

a) The specifics of channel trend monitoring under this portion of the MRP shall be developed through discussions between the Discharge and Regional Water Board staff, with other input from stakeholders and watershed professionals, as appropriate; the specifics shall be documented in SOPs and a QAPP, as described in (h) below. There is a variety of ownerships within the area in which the channel capacity appears to be reduced which will require the Discharger to obtain landowner access agreements. Regional Water Board staff will be available to assist in gaining access agreements, as needed.

b) Parameters

At a minimum, the following parameters shall be evaluated.

- Stream cross-sections, with GPS coordinates of endpoints
- Thalweg profile with elevations
- Channel bed scour-and-fill during high-flow events
- Installation and GPS coordinates of permanent benchmarks
- Water surface slope measurements over a range of flows, including high flow events

c) Locations

- The Discharger shall evaluate the existing monitoring efforts and identify the specific locations where additional measurements are needed to meet the stated objectives.
- Stream reaches to consider include the upstream extents of North Fork Elk River at Bridge Creek, South Fork Elk River at McCloud Creek, and downstream on Mainstem Elk River to the Bay. Monitoring locations should not necessarily be limited to the Discharger's ownership.
- Priority should be given to locations for which there are existing or historic data that could be used to meet the objectives.
- The specific stream segment and measurement locations shall be submitted to the Regional Water Board for approval by the Executive Officer.

d) Method of measurement

All parameters shall use reliable techniques and equipment. The Discharger, in consultation with Regional Board staff, shall develop and submit the applicable SOPs and a QAPP to the Executive Officer for approval.

e) Sampling Frequency

The frequency of measurement will vary with parameter and be determined to ensure the objectives are met.

f) Data analysis methods and performance standards

The specific data analysis methods and performance standards shall be determined once the measurement parameters, techniques, and locations are established.

g) Reporting

The reporting requirements shall be developed as part of the QAPP and shall require quarterly progress reports as well as annual reports.

h) Program Documentation, Quality Assurance and Quality Control

The Discharger shall develop and submit to the Executive Officer in accordance with the schedule established in (i) below, SOPs and a QAPP that can meet the stated objectives of this MRP.

i) Time schedule for implementation

- The Discharger, in consultation with Regional Water Board staff, shall develop SOPs, a QAPP and schedule for implementation, with seasonally dependent measurements being conducted during high flow and low flow periods, as appropriate.
- The Discharger shall provide the SOPs and QAPP to the Executive Officer for review by July 1, 2006. Upon receipt, the Executive Officer shall have 30 days to review and comment and the Discharger shall make the responsive revisions, if necessary, and resubmit within 14 days of receipt of the Executive Officer's comments for the Executive Officer's approval. If however, the Executive Officer does not provide comments within 30 days upon receipt, then the submitted QAPP shall be considered accepted and the Discharger shall implement the accepted QAPP.

3. Timing and Duration of Monitoring Plan

Monitoring and reporting under this component of the MRP shall proceed in accordance with the schedule developed under Section C.2.i and continue until the objectives have been met.

D. Landslide Monitoring

1. Objectives

a) Evaluate whether modifications to the specified effluent limitations under the provisions of the Empirical Harvest-Related Landslide Sediment Delivery Reduction Model portion of the watershed-wide WDRs are warranted.

b) Evaluate the landslide pattern and sediment discharge rate in the watershed and determine if there are changes in the response to land management activities implemented.

2. Monitoring Plan Components

a) Parameters

The landslide inventory conducted under this portion of the MRP shall include, at minimum:

- Unique identifier code
- GPS Location
- Primary watershed name
- Subbasin name
- Aerial photo year number, and scale
- Feature type
- Reactivation status
- Erosion dimensions and volumes
- Depositional dimensions and volumes
- Delivery percentage, volume, and certainty
- Type of stream affected
- Length of stream affected
- Aspect of hillslope
- Geomorphic association (including inner gorge, headwall swale, planar slope, break in slope, both vertical and horizontal convex and concave slopes, slope magnitude, other unstable areas)
- Hillslope angle
- Proximity to watercourse
- Landuse history at point of initiation, upslope, and downslope (including harvesting and roading)
- Field visit status
- Stand age at time of failure
- Geologic unit
- Field observer notes

b) Locations

All lands owned by the Discharger within the Elk River watershed shall be inventoried.

c) Method of measurement

Aerial photo review shall be coupled with field inventories to locate and map landslide features. The Discharger currently is required under the Elk River Habitat Conservation Plan Prescriptions of the HCP to conduct landslide monitoring in Elk River[1]. With the inclusion of the specific parameters described in (a) above, the inventories required under this portion of the MRP may be coupled with those already required by the HCP. At a minimum, the Discharger shall compare the 2003 aerial photos and a post-triggering event (see 2.d below) aerial photo set and shall include in the inventory all features that were not visible on the 2003 photos.

[1] Elk River Prescriptions were developed subsequent to the Elk River and Salmon Creek (ERSC) Watershed Analysis. Those prescriptions require the Discharger to conduct ERSC Watershed Reconnaissance - Level 1 Forensic Landslide Monitoring. The Discharger has developed a Standard Operating Procedure (SOP) for conducting landslide inventories: PALCO's Watershed Operating Protocol 08.

d) Sampling Frequency

Landslide inventories shall be conducted following a triggering event. The Discharger shall develop the criteria of a triggering event and provide it for review and approval by the Executive Officer associated with the QAPP. Under the HCP Elk River Prescriptions, a triggering event is defined as "(1) greater than 3 inches of rainfall within 24 hours; (2) a significant earthquake. Determining if an earthquake is a "triggering event" shall be based upon earthquake magnitude and distance of epicenter from the watershed referencing Figure 2., Graph A of Keefer (1984)." For purposes of this portion of the MRP, the Discharger may choose to provide an alternate definition, and if so shall modify the above definition to include, at a minimum, a description of an antecedent precipitation index under which watershed conditions will be prone to landsliding.

e) Data analysis methods and performance standards

The Discharger shall develop, for each inventory, a minimum landslide size detection limit for the range of canopy conditions present on the inventory lands.

f) Reporting

i. The Discharger shall document the occurrence of a triggering event and provide to the Executive Officer a written description of the event, within three (3) weeks of its occurrence.

ii. The Discharger shall provide electronic and hardcopy reports of landslide inventories within six (6) months of the triggering event. If there is some technical reason limiting the Discharger's ability to conduct the inventory and report by the due date, the Discharger shall request, in writing at least 14 days prior to the due date, an extension with the specific reasons for the delay described.

iii. Electronic reports shall include spatially registered polygon data with all attributes described in 2(a) above and shall be provided in an ArcGIS 9.x compatible format for all landslides identified in the inventory. Metadata shall accompany the data and describe the basis for the data. Additionally the data used to develop any aerial photo-to-field inventory relationships (e.g., area to volume relationships, delivery to void relationships) shall be provided as well as their associated statistical analysis.

iv. Hardcopy reports shall include the data in tabular form, summary tables, and a written description of observed landslide patterns and management correlations.

g) Program Documentation, Quality Assurance and Quality Control

The Discharger shall develop and submit to the Executive Officer in accordance with the schedule established in (i) below, SOPs and a QAPP that can meet the stated objectives of this MRP.

h) Time schedule for implementation

The Discharger shall provide the SOPs and QAPP to the Executive Officer for review by July 1, 2006. Upon receipt, the Executive Officer shall have 60 days to review and comment and the Discharger shall make the responsive revisions, if

necessary, and resubmit within 30 days of receipt of the Executive Officer's comments for Executive Officer approval. If however, the Executive Officer does not provide comments within 60 days upon receipt, then the submitted SOPs and QAPP shall be considered accepted and the Discharger shall implement the accepted SOPs and QAPP.

3. Timing and Duration of Monitoring Plan

   This component of the monitoring plan shall be implemented coincident with watershed-wide WDRs adoption, and shall be in effect throughout the life of the permit.

E. Quality Assurance and Quality Control Project Plan (QAPP)

1. The Discharger shall develop a comprehensive QAPP for the monitoring and reporting activities to be implemented. The QAPP shall address all aspects of the monitoring program and shall contain, at a minimum, but not be limited to:
   a) Standard procedures for the establishment of repeatable sampling locations;
   b) Standard operating procedures for each field method and piece of equipment used;
   c) Standard operating procedures for each laboratory method and piece of equipment used;
   d) Standard reporting procedures;
   e) Measures for quality assurance associated with monitoring and reporting procedures;
   f) Measures for quality control associated with monitoring and reporting procedures;
   g) A training program for personnel conducting monitoring activities; and,
   h) Measures for adapting the QAPP, when necessary.
   The Discharger may propose to use an existing QAPP for these measurements as long as it addresses the above list of elements.

2. Following implementation of the approved QAPP, the Discharger may propose changes to the procedures and control measures specified in the QAPP as necessary, and submit the changes to the Regional Water Board Executive Officer for approval. Following approval of changes to the QAPP, the Discharger shall document such changes and implement the new procedures and control measures immediately.

F. Work Conducted by Licensed Professionals

The practice of geology is identified and regulated under Chapter 12.5 (Geologists and Geophysicists Act) of the Business and Professions (B&P) Code, including Rules and Regulations (CCR Title 16, Division 29) and any related sections of the B&P Code, Government Code, Penal Code, and/or Evidence Code. The practice of engineering in California is identified and regulated under Chapter 7 (Professional Engineers Act) of the B&P Code, including rules and regulations (CCR Title 16, Division 5) and any related sections of the B&P Code, Government Code, Penal Code, and/or Evidence Code. The Discharger shall fully comply with all aspects of existing statutes and regulations regarding the practice of geology and/or engineering while satisfying the Terms and Provisions of this Order.

G. Signatory Requirements

All required technical reports, inspection reports, certifications, and other reports prepared in accordance with the Terms and Provisions of this Order submitted to the Regional Water Board shall be signed by the Discharger or the Discharger's duly authorized representative(s). All persons signing a document under this provision shall make the following certification:

> "I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. The information submitted is, to the best of my knowledge and belief, true, accurate, and complete."

H. Failure to comply with the terms of this Order can result in civil liabilities of up to $5,000 per day under Water Code section 13268(a)(b)&(d)(1), or misdemeanor prosecution under Water Code section 13268(c)&(d)(2).

I. Any person affected by this action of the Board may petition the State Water Resources Control Board (State Water Board) to review the action in accordance with Section 13320 of the California Water Code and Title 23, California Code of Regulations, Section 2050. The petition must be received by the State Water Board within 30 days of the date of this Order. Copies of the law and regulations applicable to filing petitions will be provided upon request. In addition to filing a petition with the State Water Board, any person affected by this Order may request the Regional Water Board to reconsider this Order. To be timely, such request must be made within 30 days of the date of this Order. Note that even if reconsideration by the Regional Water Board is sought, filing a petition with the State Water Board within the 30-day period is necessary to preserve the petitioner's legal rights. If you choose to appeal this Order, be advised that you must comply with this Order while your appeal is being considered.

Ordered by: Catherine Kuhlman

Catherine Kuhlman
Executive Officer

May 8, 2006

Attachment 1:
Elk River Water Quality Monitoring Stations (Turbidity, Suspended Sediment, Stage and Streamflow)